In the Claims

Claims 48 and 49 are canceled as follows.

1. (previously presented) A method of monitoring quality of service in communications over a packet-based network between two points, at least one of which is an endpoint,

wherein said endpoint is a telecommunications device having an interface which is accessible to a user to enable said user to participate in a telecommunications session over the network;

said telecommunications device further having an output for presenting information to said user;

the method comprising the steps of:

transmitting test packets across the network while a telecommunications session including said telecommunications device is in progress and monitoring transmission characteristics of said test packets;

dynamically calculating from said transmission characteristics a measure of network performance; and

providing at said output of said telecommunications device a dynamic indication of the network performance based on said calculation during said telecommunications session.

2. (original) A method according to claim 1, wherein said transmission characteristics are selected from packet loss, transmission delay, and a combination thereof.

3. (original) A method according to claim 2, wherein said transmission characteristics include both packet loss and transmission delay.

4. (original) A method according to claim 1, wherein the indication of the network performance is provided by means of a visual display associated with the endpoint.

5. (previously presented) A method according to claim 1, wherein the indication of the network performance is provided by means of an aural signal provided to the endpoint.

6. (original) A method according to claim 5, wherein the aural indication of the network performance is provided as a discrete signal emitted at the endpoint when the value of the metric passes a predetermined point.

7. (original) A method according to claim 1, wherein said test packets include a first series of test packets which issue from a source location to a destination location and a second series of test packets which issue from said destination location to said source location in response to said first series of test packets, whereby said network characteristics may be monitored by comparing the first and second series of test packets.

8. (original) A method according to claim 7, wherein the first series of test packets include local source timestamp information and wherein the second series of test packets include local destination timestamp information, the difference between said local source timestamp information and local destination timestamp information being used to calculate a delay characteristic of the network.

9. (original) A method according to claim 8, wherein the delay characteristic is the absolute delay in echo-free connections (Ta) between the source and destination locations over the network.

10. (original) A method according to claim 7, wherein a measure of packet loss is obtained by comparing the packets issued from the source location and the packets received back at the source location.

11. (original) A method according to claim 9, wherein a measure of packet loss is obtained by comparing the packets issued from the source location and the packets received back at the source location.

12. (original) A method according to claim 11, wherein the measure of packet loss and the identity of the communications codec being employed by the endpoint are used to calculate an equipment impairment factor (Ie).

13. (original) A method according to claim 12, wherein the calculation of Ie is made by looking up the measured packet loss in a stored table which correlates values of Ie with packet loss values for the codec being used.

14. (original) A method according to claim 11, wherein the calculated value of Ta is used to calculate a delay impairment factor.

15. (original) A method according to claim 14, wherein the delay impairment factor (Idd) is given by the formulae:

(i) for Ta < 100ms,

Idd = 0; and

(ii) for Ta => 100 ms,

Idd = 25*((1+X6)1/6 - 3*(1+(X/3)6)1/6 + 2)

Where X = (log(Ta/100))/log(2)

16. (original) A method according to claim 15, wherein a transmission rating factor R is calculated from the formula R = Y - Idd - Ie, where Y is a constant which has been predetermined for the network and the equipment being used on the network, and wherein Ie is an equipment impairment factor calculated from the measure of packet loss and the identity of the communications codec being employed by the endpoint.

17. (original) A method according to claim 16, wherein the calculation of Ie is made by looking up the measured packet loss in a stored table which correlates values of Ie with packet loss values for the codec being used.

18. (original) A method according to claim 17, wherein the value of Y is from about 92 to about 97.

19. (original) A method according to claim 18, wherein the value of Y is from about 93 to about 95.

20. (original) A method according to claim 19, wherein the value of Y is about 94.5.

21. (original) A method according to claim 16, wherein the calculated value of R is correlated to a subjective metric for the quality of service, and wherein an indication of the value of said subjective metric is provided at the endpoint to a user.

22. (original) A method according to claim 21, wherein said metric is a mean opinion score (MOS) and is calculated according to the formula:

$$MOS = 1 + 0.035R + R(R-60)(100-R)(7x10-6)$$

23. (original) A method according to claim 22, wherein said MOS is further adjusted before being provided as an indication at the endpoint, by normalising acceptable values of MOS to a different scale.

24. (original) A method according to claim 21, wherein the indication of the value of the subjective metric is provided by means of a visual display associated with the endpoint.

25. (original) A method according to claim 21, wherein the indication of the value of the subjective metric is provided by means of an aural signal provided to the endpoint.

26. (original) A method according to claim 25, wherein the aural indication is provided as a discrete signal emitted at the endpoint when the value of the metric passes a predetermined point.

27. (original) A method according to claim 1, wherein the step of providing a dynamic indication of the network performance includes providing, at the request of a user, an indication of one or more of said transmission characteristics.

28. (original) A method according to claim 27, wherein the request of the user is made by means of an input device associated with the endpoint and the indication is provided by means of a display device associated with the endpoint.

29. (original) A method according to claim 1, further comprising the step of logging the network transmission characteristics.

30. (original) A method according to claim 1, further comprising the step of logging the results of said calculation.

31. (original) A method according to claim 30, wherein the step of logging the results of said calculation occurs only when said results are within a predetermined range.

32. (original) A method according to claim 30, wherein the step of logging also includes logging the fact that a communications connection over the network has been lost.

33. (original) A method according to claim 1, further comprising the step of adjusting a billing record for a user in dependence on the results of said calculation.

34. (previously presented) A computer program product in machine readable form containing instructions which, when executed on a processor associated with an endpoint connected to a packet-based network, said endpoint being a telecommunications device having an interface which is accessible to a user to enable said user to participate in a telecommunications session over said network, said telecommunications device further having an output for presenting information to said user, cause said processor to:

monitor transmission characteristics of test packets transmitted across the network while a telecommunications session including said telecommunications device is in progress;

dynamically calculate from said transmission characteristics a measure of network performance; and

provide to said user at said output of said endpoint a dynamic indication of the network performance based on said calculation during said telecommunications session.

35. (original) A computer program product according to claim 34, wherein said transmission characteristics are selected from packet loss, transmission delay, and a combination thereof.

36. (original) A computer program product according to claim 35, wherein the transmission characteristics include the absolute delay in echo-free connections (Ta) between source and destination locations over the network, obtained by comparing

local timestamp information from source and destination locations on the network and a measure of packet loss obtained by comparing the packets issued from the source location and the packets received back at the source location.

37. (original) A computer program product according to claim 36, wherein the measure of packet loss and the identity of the communications codec being employed by the endpoint are used to calculate an equipment impairment factor (Ie).

38. (original) A computer program product according to claim 37, wherein a delay impairment factor (Idd) is given by the formulae:

(i) for Ta < 100ms,

Idd = 0; and

(ii) for Ta => 100 ms,

Idd = 25*((1+X6)1/6 - 3*(1+(X/3)6)1/6 + 2)

Where X = (log(Ta/100))/log(2)

39. (original) A computer program product according to claim 38, wherein a transmission rating factor R is calculated from the formula R = Y - Idd - Ie, where Y is a constant which has been predetermined for the network and the equipment being used on the network, and wherein Ie is an equipment impairment factor calculated from the measure of packet loss and the identity of the communications codec being employed by the endpoint.

40. (original) A computer program product according to claim 39, wherein the value of Y is from about 92 to about 97.

41. (original) A computer program product according to claim 40, wherein the value of Y is from about 93 to about 95.

42. (original) A computer program product according to claim 41, wherein the value of Y is about 94.5.

43. (original) A computer program product according to claim 39, wherein the calculated value of R is correlated to a subjective metric for the quality of service, and

wherein an indication of the value of said subjective metric is provided at the endpoint to a user.

44. (original) A computer program product according to claim 34, wherein provision of a dynamic indication of the network performance includes providing, at the request of a user, an indication of one or more of said transmission characteristics.

45. (original) A computer program product according to claim 34, further comprising instructions which when executed cause a computer to log the network transmission characteristics.

46. (original) A computer program product according to claim 34, further comprising instructions which when executed cause a computer to log the results of said calculation.

47. (original) A computer program product according to claim 34, further comprising instructions which when executed cause a computer to adjust a billing record for the a in dependence on the results of said calculation.

48. (cancelled)

49. (cancelled)

50. (previously presented) A system for monitoring quality of service in communications over a packet-based network, comprising:

a source endpoint connected to the network via which a user may transmit communication signals as part of a communications session over the network wherein said source endpoint is a telecommunications device having an interface which is accessible to a user to enable said user to participate in a telecommunications session over the network;

a test packet generator for transmitting test packets across the network during said communications session

a test packet receiver for receiving test packets from the network during said communications session;

a processor for measuring transmission characteristics of said test packets and for calculating from said transmission characteristics a measure of network performance; and

an output associated with said telecommunications device for providing a dynamic indication of the network performance to said user during said communications session based on said calculation.

51. (original) A system according to claim 50, wherein said test packet generator includes a timestamp generator for adding a local source timestamp to said test packets.

52. (original) A system according to claim 51, further comprising a destination endpoint with which said source endpoint is in communication over the network, said destination endpoint having associated therewith: a test packet receiver for receiving test packets from the network; a timestamp generator for adding a local destination timestamp to said received test packets; and a test packet re-transmitter for re-transmitting said received test packets with said local destination timestamp back to their source.

53. (original) A system according to claim 52, further comprising a centralised time server in communication with the network for generating a standardised time and providing same to said source and destination endpoints.

54. (previously presented) A method of monitoring quality of service in communications over a packet-based network between two points, at least one of which is an endpoint, comprising the steps of:

transmitting a first series of test packets location across the network from a source location to a destination, said first series of test packets including local source timestamp information;

transmitting a second series of test packets location across the network from said destination to said source location in response to the first series, said second series of test packets including local destination timestamp information;

measuring the difference between said local source timestamp information and local destination timestamp information; and

calculating from said measured difference the absolute delay in echo-free connections (Ta) between the source and destination locations over the network and thereby calculating a delay impairment factor;

providing at said endpoint a dynamic indication of the network performance based on said delay impairment factor.